Hawkeye® Installation Manual for RoGator C-Series RG900, RG1100, RG1300

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CHAPTER 1 IMPORTANT INFORMATION

SAFETY

NOTICE

Follow the operation and safety instructions included with the implement and/or controller and read this manual carefully before installing or operating this Raven system.

- Follow all safety information presented within this manual. Review implement operation with your local dealer.
- Contact a local Raven dealer for assistance with any portion of the installation, service, or operation of Raven equipment.
- Follow all safety labels affixed to system components. Be sure to keep safety labels in good condition and replace any missing or damaged labels. Contact a local Raven dealer to obtain replacements for safety labels.

Observe the following safety measures when operating the implement after installing this Raven system:

- Do not operate this Raven system or any agricultural equipment while under the influence of alcohol or an illegal substance.
- Be alert and aware of surroundings and remain in the operator seat at all times when operating this Raven system.
    - Do not operate the implement on any public road with this Raven system enabled.
    - Disable this Raven system before exiting the operator seat.
    - Determine and remain a safe working distance from obstacles and bystanders. The operator is responsible for disabling the system when a safe working distance has diminished.
    - Disable this Raven system prior to starting any maintenance work on the implement or components of this Raven system.
- Do not attempt to modify or lengthen any of the system control cables. Extension cables are available from a local Raven dealer.

DISPLAYS AND CONTROL CONSOLES

- If the display will not be used for an extended period, it is best to remove the display from the machine and store it in a climate controlled environment. This may help to extend the service life of electronic components.
- To prevent theft, secure the display and GPS antenna when leaving the machine unattended.

⚠ WARNING

AGRICULTURAL CHEMICAL SAFETY

Follow all federal, state, and local regulations regarding the handling, use, and disposal of agricultural chemicals, products, and containers. Triple-rinse and puncture or crush empty containers before properly disposing of them. Contact a local environmental agency or recycling center for additional information.

- Always follow safety labels and instructions provided by the chemical manufacturer or supplier.
- Always wear appropriate personal protective equipment as recommended by the chemical and/or equipment manufacturer.
- When storing unused agricultural chemicals:
    - Store agricultural chemicals in the original container and do not transfer chemicals to unmarked containers or containers used for food or drink.
    - Store chemicals in a secure, locked area away from human and livestock food.
    - Keep children away from chemical storage areas.
- Fill, flush, calibrate, and decontaminate chemical application systems in an area where runoff will not reach ponds, lakes, streams, livestock areas, gardens, or populated areas.
- Follow all label instructions for chemical mixing, handling, and disposal.
- Avoid direct contact with agricultural chemicals or inhaling chemical dust or spray particulate. Seek immediate medical attention if symptoms of illness occur during, or soon after, use of agricultural chemicals or products.
- After handling or applying agricultural chemicals:
    - Thoroughly wash hands and face after using agricultural chemicals and before eating, drinking, or using the restroom.
    - Thoroughly flush or rinse equipment used to mix, transfer, or apply chemicals with water after use or before servicing any component of the application system.

⚠ CAUTION

ELECTRICAL SAFETY

- Always verify that power leads are connected to the correct polarity as marked. Reversing the power leads could cause severe damage to the Raven system or other components.
- To prevent personal injury or fire, replace defective or blown fuses with only fuses of the same type and amperage.
- Do not connect the power leads to the battery until all system components are mounted and all electrical connections are completed.
- Always start the machine before initializing this Raven system to prevent power surges or peak voltage.
- To avoid tripping and entanglement hazards, route cables and harnesses away from walkways, steps, grab bars, and other areas used by the operator or service personnel when operating or servicing the equipment.

TOUCH SCREEN

- Only touch the touch-screen with your finger or by using a special touch-screen stylus/pen. Operating the touch-screen with sharp objects may cause permanent damage to the screen.
- Only clean the screen using a damp cloth. Never use caustic or other aggressive substances.

RECOMMENDATIONS AND BEST PRACTICES

HARNESS ROUTING

The word “harness” is used to describe any electrical cables and leads, both bundled and unbundled. Use the following guidelines and recommendations when connecting and routing harnesses while installing or maintaining this Raven system:

- Leave protective caps/covers over harness connectors until needed to avoid dirt and moisture from contaminating electrical circuits.
- Secure the harness to the frame or solid structural members at least every 12 in [30 cm].
- Follow existing harness runs already routed on the implement as much as possible. Proper harness routing should:
    - Secure harnessing and prevent the harness from hanging below the implement.
    - Provide sufficient clearance from moving components and operational zones around shafts; universal joints and suspension components; pulleys, gears, belts, and chains; moving linkages, cylinders, articulation joints, etc.
    - Protect harnessing from field debris and surrounding hazards (e.g. tree limbs, fence posts, crop stubble, dirt clumps or rocks that may fall or be thrown by the implement).
    - Protect harnessing from sharp bends, twisting, or flexing over short distances and normal implement operation.
    - Connectors and splices should not be located at bending points or in harness sections that move.
    - Ensure sufficient length for free movement of the implement during normal operation and prevent pulling, pinching, catching, or rubbing, especially in articulation and pivot points. Clamp harnessing securely to force controlled movement of the harness.
    - Avoid abrasive surfaces and sharp edges such as sheared or flame cut corners, fastener threads or cap screw heads, hose clamp ends, etc.
- Do not connect, affix, or allow harnessing to come into contact with components with high vibration forces, hot surfaces, or components carrying hot fluids beyond the temperature rating of harness components.
    - Harnessing should be protected or shielded if routing requires the hose to be exposed to conditions beyond harnessing component specifications.
- Avoid routing harnesses in areas where damage may occur due to build up of material (e.g. dirt, mud, snow, ice, etc.).
- Avoid routing harnesses in areas where the operator or service personnel might step or use as a grab bar.

IMPORTANT: Avoid applying direct spray or pressure washing of electrical components and connections. High pressure streams and sprays can penetrate seals, cause corrosion, or otherwise damage electrical components. When performing maintenance:

- Inspect electrical components and connectors for corrosion, damaged pins or housings, etc. Repair or replace components or harnessing as necessary.
- Ensure connectors are kept clean and dry. Apply dielectric grease to the sealing surfaces of all connections exposed to moisture, dirt, debris, and other contaminates. Repair or replace harnessing as necessary.
- Clean electrical components with pressurized air, aerosol electrical cleaning agent, or low pressure rinse.
- Remove visible surface water from electrical components and connections using pressurized air or an aerosol cleaning agent. Allow components to dry thoroughly before reconnecting cables.

CHAPTER 2 INTRODUCTION

Hawkeye® nozzle control is a pressure based product control system designed for precise sprayer application in a variety of conditions. Pressure based application control provides accurate control of droplet size which reduces spray drift during field operations.

MAKE AND MODEL INFORMATION

Hawkeye® is compatible with the ISOBUS communication platform which allows the system to work with most ISO Universal Terminals (UTs) and Task Controllers on the market. This manual is intended to provide installation instructions on the following equipment:

TABLE 1. AGCO RoGator Make and Model Information

Make	Model	Model Years	Boom Configuration
AGCO	RoGator C-Series RG900, RG1100, RG1300	2018+	132’ Boom 19” and 20” Spacing
			120’ Boom 20”, 19”, and 15” Spacing
			100’ Boom 20”, 19”, and 15” Spacing
			90’ Boom 20” and 15” Spacing

FIGURE 1. RoGator 1300B

SECTION SPACING

The information in the table below is required for the machine configuration process on the field computer. Refer to the Hawkeye Operation Manual for machine configuration and operation information.

NOTE: Each column shown in the tables below identifies a specific sprayer boom configuration. Boom width, in feet, is the first number. Nozzle spacing, in inches, is the second number. As an example, a 90 foot boom with 10 inch nozzle spacing is represented as 90'/10".

TABLE 2. AGCO RoGator C, 16 Section Breakdown (90'-100')

Switch	Section	90'/ 10"	90'/ 15"	90'/ 20"	100'/ 10"	100'/ 15"	100'/ 19"	100'/ 20"
1	1	20	15	40	50	45	76	40
	2	40	30	40	60	60	76	60
	3	50	60	40	60	60	76	60
	4	60	60	60	60	60	76	80
2	5	90	90	60	70	90	76	60
	6	100	90	120	120	90	76	60
	7	120	135	120	120	135	95	120
3	8	110	105	60	110	105	95	60
4	9	120	135	60	120	135	95	60
	10	100	90	120	120	90	76	120
	11	90	90	120	70	90	76	120
5	12	60	60	60	60	60	76	60
	13	50	60	60	60	60	76	80
	14	40	30	40	60	60	76	60
	15	20	15	40	50	45	76	60
	16			40				40

TABLE 3. AGCO RoGator C, 16 Section Breakdown (120'-132')

Switch	Section	120'/ 10"	120'/ 15"	120'/ 19"	120'/ 20"	120'/ 20" AL	132'/ 19" AL	132'/ 20" AL
1	1	80	60	114	60	80	38	80
	2	80	90	133	80	80	76	80
	3	80	90	76	80	80	114	80
	4	90	90	76	120	80	171	120
2	5	80	60	114	80	100	114	80
	6	120	135	76	120	120	171	120
	7	130	135	76	120	120	76	180
3	8	110	105	95	60	60	95	60
4	9	130	135	76	60	60	76	60
	10	120	135	76	120	120	171	180
	11	80	60	114	120	120	114	120
5	12	90	90	76	80	100	171	80
	13	80	90	76	120	80	114	120
	14	80	90	133	80	80	76	80
	15	80	60	114	80	80	38	80
					60	80		80

MACHINE CONFIGURATION NOTES

- The AGCO AccuTerminal does not need to have settings changed to function with Raven Product Controller II (PCII).
- The AGCO AccuTerminal and other ECUs should be updated to the latest software by an AGCO Service Provider. The AGCO RoGator C Liquid EXT software must be updated to version 1.02 or newer.
- The PCII ECU should be updated to the latest software release.
- When prompted to setup the machine configuration, complete the following steps:

NOTE: Machine configuratino process is compatible for Hawkeye NCVs, AGCO ProStop-E valves, or both Hawkeye NCVs and AGCO ProStop-E valves simultaneously with dual outlet nozzle bodies. The process only needs to be completed once during the initial installation.

1. Refer to tables above to find the matching boom/spacing configuration column to the physical machine.
2. Input the number of sections of the matching boom/spacing in the section setup screen as shown in Figure 2, “Section Setup - Number of Sections,” below. There will be 15 or 16 sections based on the “Section” column in the tables above.

NOTE: It is not necessary to check the fence row option as this functionality is controlled via AGCO switches and cabling.

FIGURE 2. Section Setup - Number of Sections

3. Press Next to advance.

4. For each section, use the color coordination in the tables above to select which switch the section will be mapped to as shown in Figure 3, “Switch Mapping - Assigning Sections,” below.

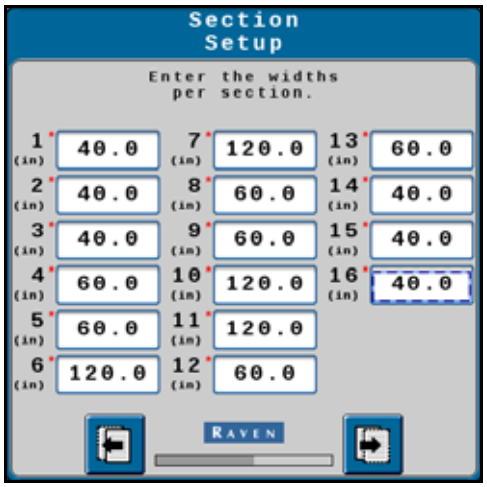
NOTE: Only use numbers 1-5 in the drop-down list for each section according to the color code in the tables.

FIGURE 3. Switch Mapping - Assigning Sections

NOTE: Number of switches may vary from the images shown above.

5. Ensure that the displayed values match the table, and then press Next.
6. For each section, enter the corresponding section width value from the tables above as shown in Figure 4, “Section Setup - Section Widths,” below.

FIGURE 4. Section Setup - Section Widths



NOTE: Number of sections may vary from the images shown above.

7. Ensure the displayed selections are accurate, and then press Next.

OVERVIEW OF THE INSTALLATION PROCESS

The recommended process for installing the Hawkeye® nozzle control system is as follows:

1. Check Hawkeye® kit contents. See the *Kit Contents* section on page 9.
2. Replace existing strainer with an 80 mesh (or finer) strainer. See the *Hawkeye Installation Preparation* section on page 7.
3. Remove spray tips and flush each section individually for a minimum of 20 seconds to thoroughly flush the boom.
4. Mount Hawkeye® nozzle control valves. See the *Hawkeye Nozzle Control Valve Installation* section on page 8.
5. Route and connect the secondary and primary boom cables. See the *Boom Cable Routing and Connection* section on page 10.
6. Mount the Hawkeye® product controller II ECU. See the *Product Controller II ECU Installation* section on page 13.
7. Route and connect chassis cable. See the *Chassis Cable Routing and Connection* section on page 19.

REQUIRED COMPONENTS

The following components must be installed with the Hawkeye nozzle control system:

- Updated software on field computers or control monitors. Contact your local RoGator dealer for the latest software.
- PWM pump control valve
- Raven compatible flow meter
- Raven compatible pressure transducer
- 80 mesh (or finer) strainer

NOTE: Do not use air induction tips with the Hawkeye® nozzle control system. A fan or cone style spray tip is required for the Hawkeye system to operate properly.

TOOLS AND MATERIALS NEEDED

The following tools are recommended for completing the installation:

- SAE and metric sized wrenches and tools
- 1-1/2” hole saw
- Drill bit set and drill
- Dielectric grease (supplied)
- Cable ties (supplied)

POINT OF REFERENCE

The instructions provided in this manual assume the installer is standing behind the machine, looking toward the machine cabin.

KIT CONTENTS

TABLE 4. Kit components for AGCO RoGator C-Series equipment begin on the next page.

Item Description	Part Number	Qty.												
		117-1007-												
		200	201	202	203	204	205	206	207	208	212	213	215	216
Manual - AGCO RoGator C-Series Hawkeye Installation	016-0171-655													
Manual - Hawkeye® Calibration and Operation	016-0171-584							1						
Sheet - Warranty/Help	016-0171-649							1						
Quick Start Guide - Hawkeye Start-Up	016-0171-598							1						
Spacer - Boom Bump Stop, RoGator	107-0172-609							4	4	4				
Bolt - Hex, M6 x 1.0 x 75 Stainless	311-4058-147							12	12	12				
ECU - ISO Product Controller II	063-0173-704							1						
Cable - ECU, Hawkeye RoGator 2018+	115-7303-308							1						
Cable - Bulkhead, Hawkeye, RoGator 2018+	115-7303-309							1						
Cable- Chassis, Hawkeye RoGator 2018+	115-7303-310							1						
Cable - Primary RG 900/1100/ 1300 (120', 20")	115-7305-068	2						2						
Cable - Primary RG 900/1100/ 1300 (100', 20")	115-7305-109		2	2					2	2				
Cable - Left Primary RG 900/1100/1300 (120', 15")	115-7305-123				1									

Item Description	Part Number	Qty.												
		117-1007-												
		200	201	202	203	204	205	206	207	208	212	213	215	216
Cable - Right Primary, RG 900/1100/1300 (120', 15")	115-7305-140				1									
Cable - Left Primary RG 900/1100/1300 (90'/100', 15")	115-7305-129					1	1							
Cable - Right Primary, RG 900/1100/1300 (90'/100', 15")	115-7305-158					1	1							
Cable - Primary RG 900/1100/ 1300 (132' Millennium Boom, 20")	115-7305-396										2			
Cable - Left Primary, RG (120', 19")	115-7306-037											1		
Cable - Right Primary RG (120', 19")	115-7306-038											1		
Cable - Left Primary, RG (132', 19")	115-7306-041												1	
Cable - Right Primary RG (132', 19")	115-7306-042												1	
Cable - Left Primary, RG (100', 19")	115-7306-051													1
Cable - Right Primary RG (100', 19")	115-7306-052													1
Cable - Secondary RG 900/1100/1300 (120', 20")	115-7305-069	2						2						
Cable - Secondary RG 900/1100/1300 (100', 20")	115-7305-110		2						2					

Item Description	Part Number	Qty.												
		117-1007-												
		200	201	202	203	204	205	206	207	208	212	213	215	216
Cable - Secondary RG 900/1100/1300 (120', 15")	115-7305-124				2									
Cable - Secondary RG 900/1100/1300 (90', 20")	115-7305-128			2						2				
Cable - Secondary RG 900/1100/1300 (90', 15")	115-7305-130						2							
Cable - Secondary RG 900/1100/1300 (100', 15")	115-7305-131					2								
Cable - Mid RG 900/1100/1300 (132' Millennium Boom, 20")	115-7305-397										2			
Cable - Mid RoGator (120', 19")	115-7306-039											2		
Cable - Mid RoGator (132', 19")	115-7306-043												2	
Cable - Mid RoGator (100', 19")	115-7306-053													2
Cable - Outer RG (900/1100/1300 (132' Millennium Boom, 20")	115-7305-193										2			
Cable - Outer RoGator (120', 19")	115-7306-040											2		
Cable - Outer RoGator (132', 19")	115-7306-044												2	

Item Description	Part Number	Qty.												
		117-1007-												
		200	201	202	203	204	205	206	207	208	212	213	215	216
Cable - Outer RoGator (100', 19")	115-7306-054													2
Nozzle Body - Triple Nozzle, 1" Wet Boom, Hypro	334-0002-196	2	2	2	2	2	2				2			
Hawkeye Nozzle Control Valve - Hypro	063-0173-673	72	60	54	95	79	71				80	75	85	63
Hawkeye Nozzle Control Valve - Wilger	063-0173-674							72	60	54				
Fuse - 70A, Bolt Down, M5, MIDI/AMI	510-1003-048	1												
Nut - Nylon Flange Lock Zinc (M5 x 0.8)	312-4000-215	2												
Nut - Nylon Flange Lock Zinc (M8 x 1.25)	312-4000-217	1												
Bolt - 1/4"-20 x 1.5" Hex	311-0050-107	4												
Nut - Zinc Flanged Lock 1/4"-20	312-1001-168	4												
Washer - 0.265 x 0.505 x 0.060	313-2300-120	4												
Wilger - Adapter C/C Male Plug	333-0002-319							13	13	13				
Wilger - Adapter Assembly, Combo-Jet to SS	333-0002-322							146	122	110				
Wilger - End Nozzle Body, Blended Pulse	333-0002-325							73	61	55				
Wilger - Nozzle Body 1" 2-Way 3/8" Inlet, Mod	333-0002-332							13	13	13				

Item Description	Part Number	Qty.												
		117-1007-												
		200	201	202	203	204	205	206	207	208	212	213	215	216
Adapter - ProStop-E to Wilger Nozzle Body	063-0173-964							73	61	55				
Wilger - Thru Nozzle Body, No On/Off Cap	333-0002-349							61	49	43				
Wilger - Saddle W/O Nozzle, 1" Tube, 3/8" Inlet	333-0002-350							61	49	43				
Kit - Hypro Hawkeye System Service	117-1005-057	1	1	1	1	1	1				1	1	1	1
Kit - Wilger Hawkeye System Service	117-1005-058							1	1	1				
O-Ring - Viton, Green Coated, -115, 56 Pack	219-1005-115M	2	2	1	2	2	2				2	2	2	2
O-Ring - Viton, Brown, -116, 56 Pack	219-1005-116M							2	2	1				

TABLE 5. Hawkeye Service Kit, Hypro Components (P/N 117-1005-057)

Picture	Item Description	Part Number	Quantity
	Hawkeye Nozzle Control Valve, Hypro	063-0173-673	1
Not Pictured	Kit, Seal, Hawkeye Valve, Hypro	117-1005-051	3
Not Pictured	Hawkeye Valve Jumper	115-7303-139	2
	Hawkeye Valve Tool	321-0000-490	2

TABLE 6. Hawkeye Service Kit, Wilger Components (P/N 117-1005-058)

Picture	Item Description	Part Number	Quantity
	Hawkeye Nozzle Control Valve, Wilger	063-0173-674	1
Not Pictured	Kit, Seal, Hawkeye Valve, Wilger	117-1005-052	3

Picture	Item Description	Part Number	Quantity
Not Pictured	Hawkeye Valve Jumper	115-7303-139	2
Not Pictured	O-Ring - Viton, Brown	219-1005-116	1
Not Pictured	Relay, 12 V N.O. Micro, 280 SRS	415-1001-020	2
Not Pictured	Fuse, 15 AMP Mini Blade Type	510-1003-041	2
	Hawkeye Valve Tool	321-0000-490	2

UPDATES

Raven software and documentation updates may be made available periodically on the Raven Applied Technology web site:

www.ravenprecision.com

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Your feedback will help shape the future of our product documentation and the overall service we provide. We appreciate the opportunity to see ourselves as our customers see us and are eager to gather ideas on how we have been helping or how we can do better.

To serve you best, please send an email with the following information to

techwriting@ravenind.com

-Hawkeye® Installation Manual for RoGator C-Series RG900, RG1100, RG1300
-016-0171-655 Rev. G
-Any comments or feedback (include chapter or page numbers if applicable).
-Let us know how long have you been using this or other Raven products.

We will not share your email or any information you provide with anyone else. Your feedback is valued and extremely important to us.

Thank you for your time.

CHAPTER 3 INSTALLATION PREPARATION

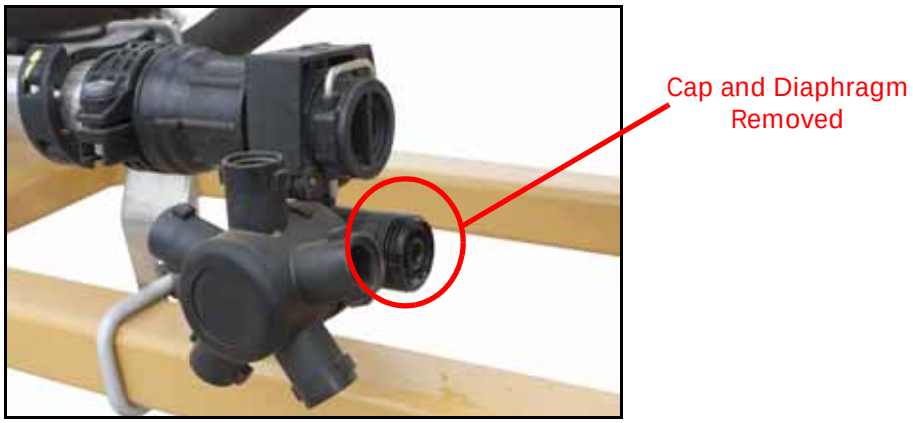
Perform the following procedure to prepare fir the Hawkeye® nozzle control installation.

⚠ CAUTION

Chemical residues may be present. Thoroughly bleed pressure from chemical lines and rinse the system with clean water prior to installing or servicing fittings, hoses, valves, or nozzles in the application system.

1. Rinse and fill the tank with clean water.
2. Move the equipment to an open area suitable for testing application system operation and rinsing the boom plumbing.
3. Unfold the boom and enable the application control system. Verify that all control hardware (e.g. control valves, section valves, etc.) and spray tips function as expected.
4. Operate the system until all chemicals are rinsed from the boom supply lines.
5. Disable the application control system and de-pressurize the boom.
6. Replace existing carrier line strainer(s) with an 80 mesh (or finer) strainer. An 80 mesh (or finer) strainer is required for use with the Hawkeye® nozzle control system.
7. If turret style nozzle bodies are installed on the implement, rotate the turret to an open spray position, if available. If an open spray position is not available, or for nozzle bodies without a turret, remove the spray tips from the boom and set aside for later use.
8. Enable the application control system and run clean water for at least 20 seconds to rinse any remaining debris from the boom plumbing and nozzle bodies.
9. Remove the cap and diaphragm from the nozzle bodies.

FIGURE 1. Nozzle Body Cap and Diaphragm Removed



CHAPTER 4 NOZZLE CONTROL VALVE INSTALLATION

HAWKEYE NOZZLE CONTROL VALVE INSTALLATION

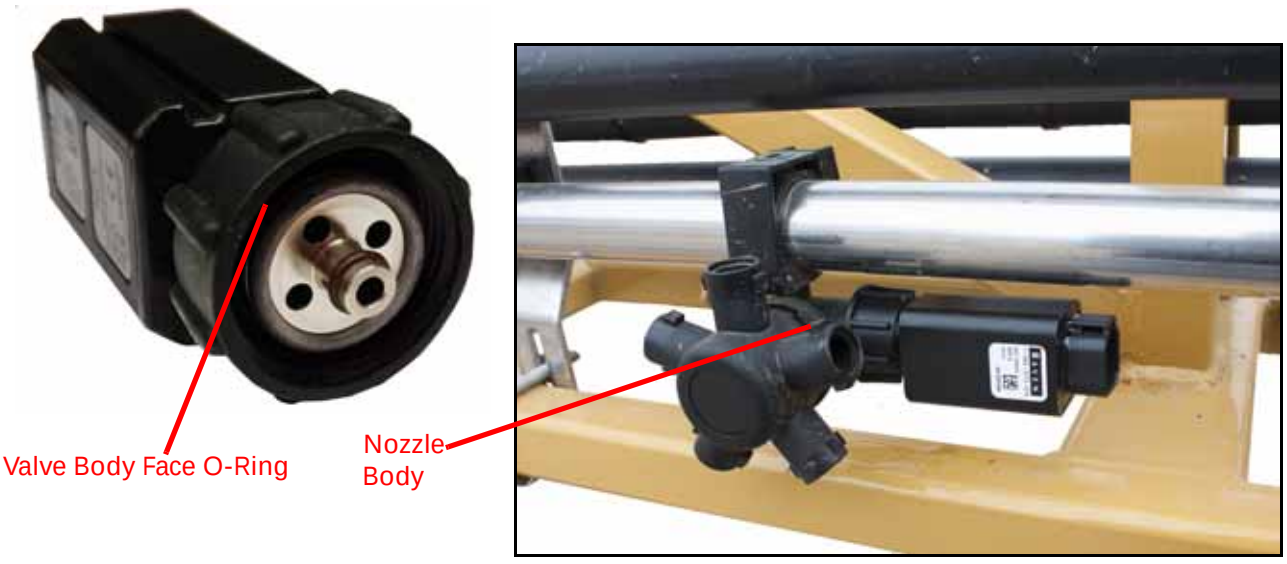
After rinsing the debris out of the plumbing, mount the Hawkeye® nozzle control valves to the existing nozzle bodies.

BEST PRACTICES AND RECOMMENDATIONS

- Do not connect battery leads until all cables are installed and connected.
- If a dual channel turret nozzle body is installed on the implement, always mount the Hawkeye® nozzle control valve to the straight nozzle port to avoid excessive pressure drop across the nozzle.
- If there are obstacles that interfere with the Hawkeye® valve installation it may be necessary to purchase a different brand of nozzle body with a threaded port on the opposite side.

GENERAL VALVE INSTALLATION

FIGURE 1. Valve Face O-Ring and Nozzle Control Valve



1. Place the supplied O-ring on the inside of the fly nut flush with the valve body face.

NOTE: If using TeeJet QJS (straight) nozzle bodies, use the green coated (size 115) O-ring. For AGCO Hypro nozzle bodies, use the green coated (size 115) O-ring. For TeeJet QJ (turret) nozzle bodies, use the brown/gray (size 116) O-rings.

FIGURE 2. Green Coated and Brown/Gray O-Rings

2. Thread the fly nut onto the nozzle body.
3. Orient the nozzle control valve so that the label is easily readable.
4. Hand tighten the swivel nut to secure the nozzle control valve to the nozzle body. Do not over tighten.

NOTE: Frequently check the nozzle control valve fly nuts to ensure they are secure.

PROSTOP-E WITH WILGER NOZZLE BODY ASSEMBLY

NOTE: For kit numbers ending in 206 - 208, the Hawkeye system will control the Hypro ProStop-E in addition to the NCV. In order to accommodate both valves, a Wilger dual drop nozzle body is installed along with an adapter for the ProStop-E adapter.

1. Install the four O-rings into the ProStop-E adapter.

FIGURE 3. ProStop-E Adapter O-Ring Installation

2. Remove the ProStop-E valve from the Hypro nozzle body by removing the U-clip that attaches it to the threaded nut.

NOTE: Leave the ProStop-E connected to the existing cabling.

3. Remove the Hypro Nozzle body from the boom tubing.

4. Thread the ProStop-E adapter (P/N 063-0173-964) to the Wilger nozzle body.

FIGURE 4. ProStop-E Adapter Installation Location

5. Attach the Wilger nozzle body to the boom.
6. Install the Hawkeye® NCV to the Wilger drop closest to the wet boom tube.
7. Using the U-clip, install the ProStop-E to the previously installed adapter. Ensure the flat surface on the U-clip is towards the ProStop-E body (tabs down).

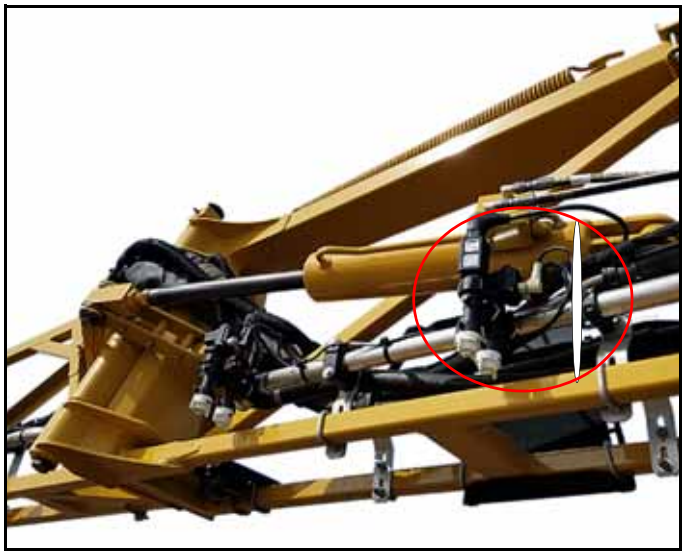
SPECIAL INSTALLATION INSTRUCTIONS

1. In the areas of the center rack and the first three nozzle bodies of the primary boom where the wet pipe is offset behind the boom way inlet use the modified nozzle assembly. The assembly requires the Wilger nozzle body 2-way inlet (P/N 333-0002-332), the Wilger adapter plug (P/N 333-0002-319), and Wilger end body (P/N 333-0002-325).

FIGURE 5. Completed Wilger Assembly

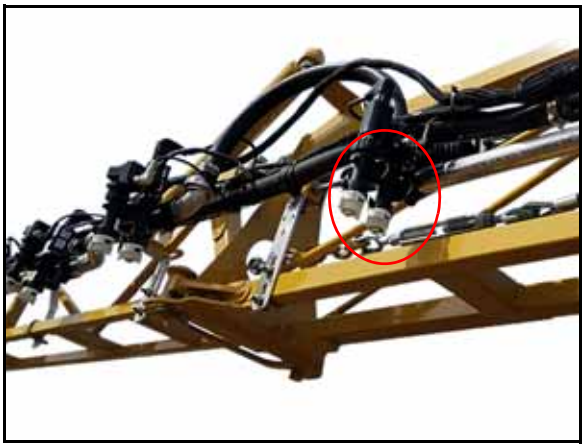
2. The locations listed below require that the Hawkeye® NCV is installed in the rear position and the ProStop-E is in the forward position, closest to the boom tube:
    - Just below the secondary boom fold cylinder, base end.

FIGURE 6. Cylinder Base End Installation



- The last nozzle body before the break away section.

FIGURE 7. Break Away Section Installation



BUMPER INSTALLATION FOR C-SERIES MACHINES WITH PROSTOP-E VALVES AND WILGER NOZZLE BODIES

1. Locate the boom stops and remove the existing hardware. Keep the existing washers and nuts.

FIGURE 8. Boom Stop

2. Place two boom stop spacers (P/N 107-0172-609) behind the boom stop.

FIGURE 9. Installed Boom Spacers

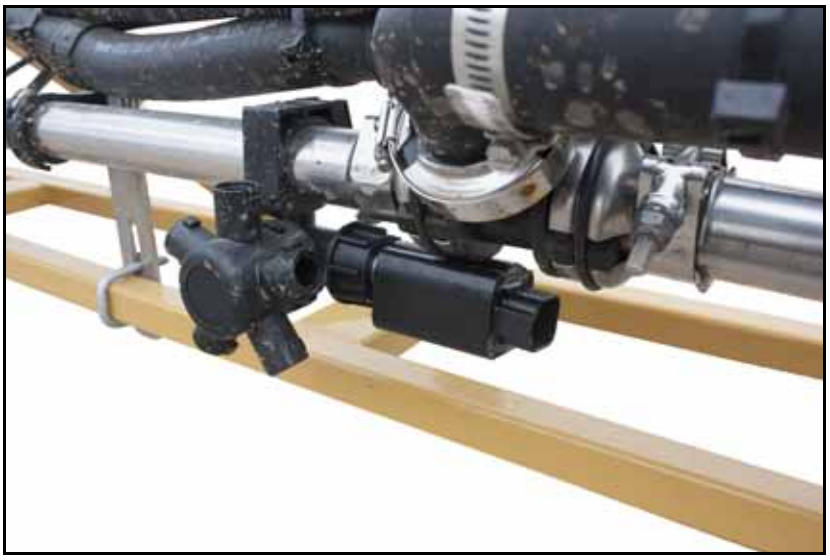
3. Use the longer bolt provided in the kit (P/N 311-0070-014) and the original nuts and washers to secure the boom stop and spacers.

VALVE MOUNTING INTERFERENCE AND OBSTRUCTIONS

In some locations on the spray boom, boom equipment or hardware may interfere with mounting the Hawkeye® nozzle control valves. In these locations, there are a few options to get around the interferences:

1. Rotate the nozzle control valve so the round, low profile side of the NCV is towards the interference.

FIGURE 10. Modified Nozzle Control Valve Installation



2. Loosen the brackets and slide them out of the way of the NCV. Verify the brackets still adequately support the components as intended. Do not remove the brackets completely.
3. If the first two options do not solve the interference, swap the AGCO nozzle body for a triple nozzle body (provided in the kit) with the threaded connection for the Hawkeye® valve facing away from the interference.

FIGURE 11. Triple Nozzle Body Installed

NOTE: Avoid removing of any existing boom hardware or support brackets where applicable during installation of the Hawkeye® nozzle control valves.

BOOM CABLE ROUTING AND CONNECTION

BEST PRACTICES AND RECOMMENDATIONS

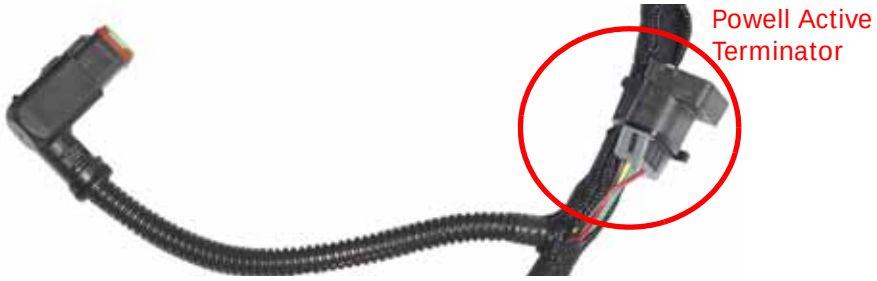
- Route the Hawkeye® primary and secondary boom cables along existing cables or plumbing to avoid cable damage.
- Route cables to avoid pinch points and to avoid stretching the cable during folding and unfolding operations. Pay special attention to cable routing near folding or break-away points.
- Route cables through existing cable retention devices as appropriate.
- When securing the primary and secondary boom cables on the implement, begin at the outer boom tips. Adjust the cable position to provide sufficient slack between valve tee branches while working toward the center of the implement.
- Route the boom cables on the inside of the boom frame when available.
- Secure cables using a zip tie at each nozzle control valve tee branch, and one between each tee branch along the cable length.

SECONDARY BOOM CABLE ROUTING AND CONNECTIONS

NOTE: Please review the *Best Practices and Recommendations* section on page 25 before routing or securing the boom cables on the implement. Do not connect or secure the cable until instructed to do so in the procedure.

1. Locate the terminator on each of the secondary boom cables (refer to the *Kit Contents* section on page 9).

FIGURE 12. Secondary Cable ISOBUS Powell Terminator



NOTE: Verify the terminators are secured to the main cable trunk using a zip tie through the connector retainer clip. If terminators are not secured, wire breakage could occur.

2. Route the secondary boom cables so they are located at the outer tips of the left and right boom.
3. Starting from the mid-boom fold point, feed the terminator end of the secondary boom cable through the boom framework along existing cable or plumbing runs and through any existing cable retention devices as appropriate.

NOTE: If there is interference between the connector and boom components, remove the 90° back shell from the connector. Refer to Figure 14 on page 26.

4. If not already applied, apply a single short burst of corrosion inhibitor (Corrosion X HD (Raven P/N 222-0000-020 or available from http://www.corrosionx.com/corrosionx-heavy-duty.html)) into the NCV connection. Be sure the corrosion inhibitor has coated the NCV contacts and recessed portions of the connector.

NOTE: To determine is corrosion inhibitor has been applied, inspect for a thick liquid in the bottom of the connector.

5. Starting with the nozzle control valve at the outer end of the boom, begin connecting the valve tee branches to the nozzle control valves.

FIGURE 13. Securing Valve Branches

6. At each valve branch, adjust the cable as necessary to provide slack between nozzle control valve connections. The large round connector on the secondary boom cable should reach to the mid-boom fold point after all nozzle control valves are connected.

FIGURE 14. Primary and Secondary Boom Cable Connection at Mid-Boom Fold Point

7. Repeat step 1 through step 5 to route and connect the secondary boom cable on the opposite boom.

NOTE: Route and connect the primary and secondary cables before securing the cable with the supplied zip ties.

PRIMARY BOOM CABLE ROUTING AND CONNECTIONS

NOTE: Review the *Best Practices and Recommendations* section on page 25 before routing or securing the boom cables on the implement. Do not connect or secure the cable until instructed to do so in the procedure.

1. Locate the large, round connectors on the primary boom cables (refer to the *Kit Contents* section on page 9). Route the primary cables so the connector with female pins is located at the mid-boom fold point of the left or right boom and will connect to the secondary boom cable.

FIGURE 15. Primary Cable Ends

Male Connector
To Center Rack/Chassis Connector

Female Receptacle
To Secondary Boom Cable/Mid-Boom Fold Point

2. Starting at the center of the implement, feed the female receptacle end of the primary boom cable through the boom framework along existing cable or plumbing runs and through any existing cable retention devices.
3. Connect the large, round connectors on the primary and secondary boom cables to each other.
4. Adjust the primary and secondary boom cables to ensure sufficient slack around the mid-boom fold point and allow each cable to reach nozzle control valves near the folding point.
5. Secure the primary and secondary connection using the supplied zip ties as necessary to protect the connector from damage during folding and unfolding operations.
6. Starting at the valve on the primary boom segment furthest from the center of the implement, connect the valve tee branches to the nozzle control valves.
7. At each valve branch, adjust the cable as necessary to provide slack between nozzle control valve connections and use the supplied zip ties to secure the cable at each valve branch. Refer to Figure 13 on page 26. The large, round connector with male pins on the primary boom cable should reach to the center of the implement after all nozzle control valves are connected.
8. Repeat this procedure to route the primary boom cable on the opposite boom.

CHAPTER 5 ISOBUS ECU MOUNTING AND CONNECTION

PRODUCT CONTROLLER II ECU INSTALLATION

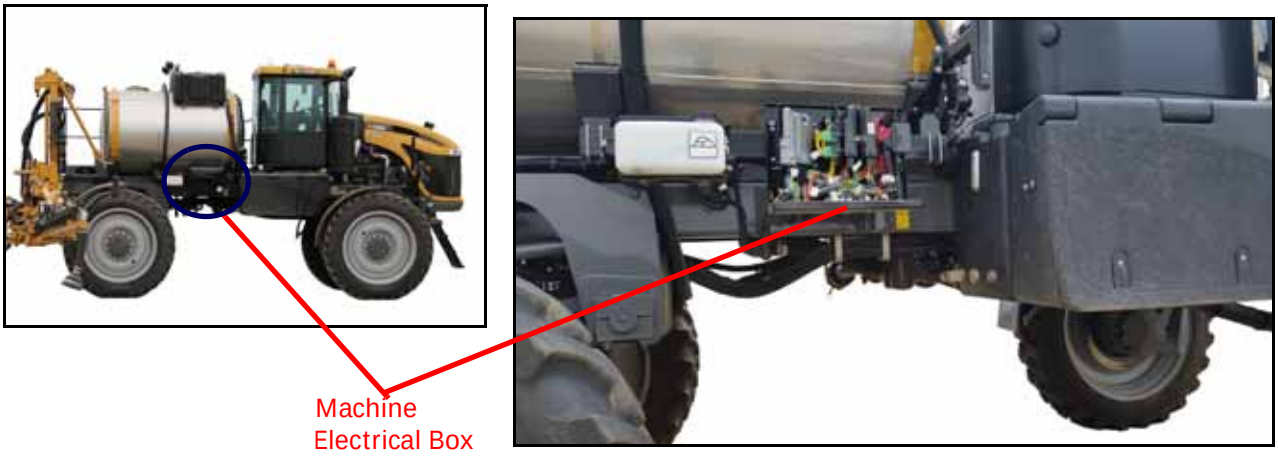
BEST PRACTICES AND RECOMMENDATIONS

- Do not connect battery leads until all cables are installed and connected.
- If a protected mounting location is not available on the equipment, mount the Hawkeye® product controller II ECU with the connectors facing down toward the ground to help keep moisture from accumulating in the ECU.

ELECTRICAL BOX PREPARATION

1. Locate the electrical box on the right side of the machine, between the axles and remove the cover.

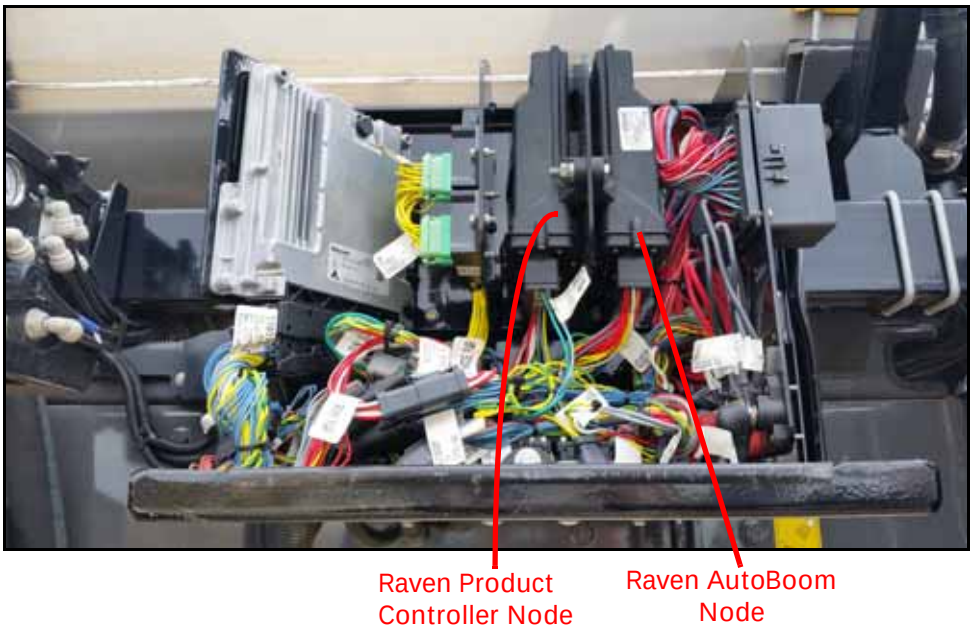
FIGURE 1. RoGator 1300 Electrical Box Location



2. Locate the Raven Product Control Node.
3. Use a socket and socket extension to loosen the bolt securing the node mounting plate and remove the plate from the electrical box.

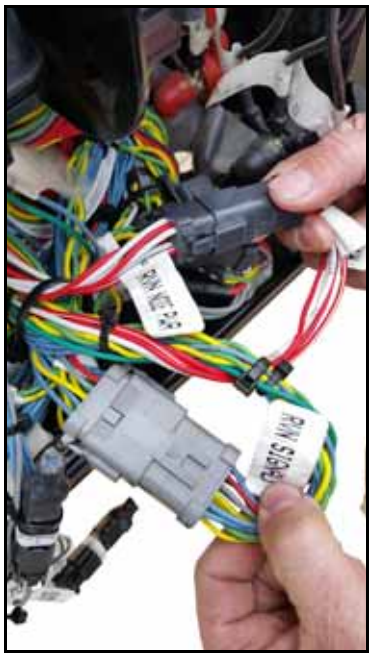
NOTE: The mounting plate will be modified to mount the Product Controller II ECU in the *Mounting Plate Preparation and ECU Installation* section on page 32.

FIGURE 2. Node Mounting Plate Modifications



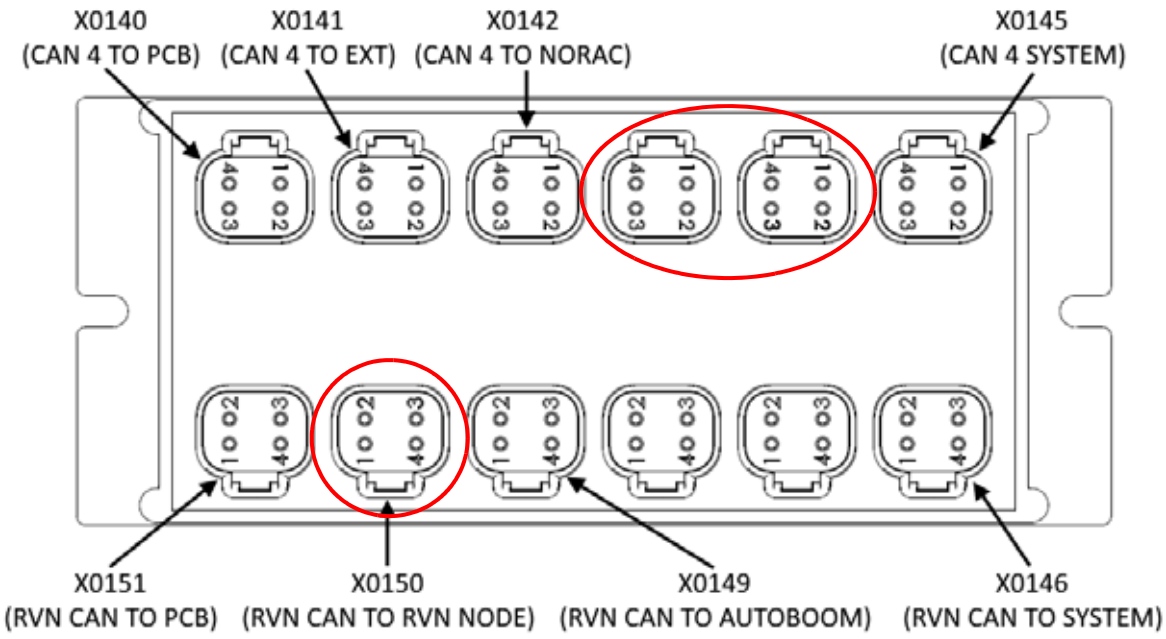
4. Remove the bolts securing the Product Controller node to the mounting plate.
5. Remove the Raven Product Controller Node if installed. This step is not needed on AGCONTROL systems.
6. Locate the X0778 connectors (RVN PWR) and X0780 (RVN SIGNALS) and disconnect the Product Controller Node jumper cable connections. The jumper cable can be set aside with the Product Controller Node.

FIGURE 3. Power and Signal Connections



7. For signals to reach the X0780 connector, complete step a through step d. If it is a Raven controlled machine, it may already be connected.
   a. Connect the Hawkeye® Adapter Cable (P/N 115-7303-308) 6-pin and 8-pin Deutsch connectors to X0778 and X0780. These connections may already be made on a Raven controlled machine.
   b. Remove the cap from the X0777 (RAVEN SIGNAL NODE).
   c. Connect the X0775 (CNTRL SIGNAL) to X0777 (RAVEN NODE SIGNAL).
   d. Place the cap on X0776 (EXT SIGNAL).
8. Remove the plug from one of the two highlighted locations on the CAN PCB in the electrical box.
9. Locate the connector labeled X0150 RVN CAN to RVN Node on the CAN PCB and move it to one of the open slots made by removing the plug earlier.

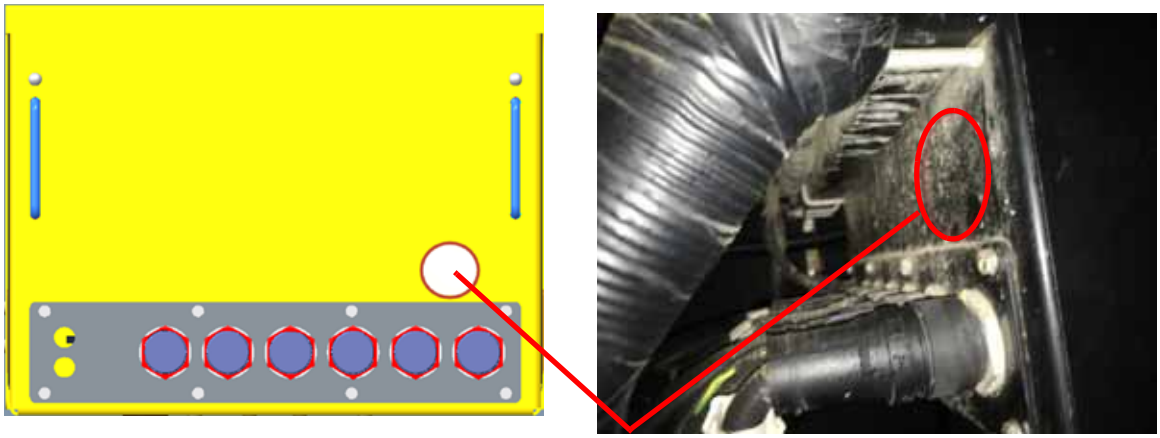
FIGURE 4. Hawkeye Node Connected to ISOBUS



10. Use a 1-1/2” hole saw to drill a hole through the back of the electrical box in a location where the Hawkeye® system will not interfere with the existing electrical components (refer to Figure 5 on page 32).

NOTE: Be careful not to damage any existing electrical components while drilling. This hole will be used later to connect the chassis cable to the electrical box cabling for final system connections.

FIGURE 5. Access to Electrical Box for Hawkeye Chassis Cable



MOUNTING PLATE PREPARATION AND ECU INSTALLATION

1. Using the Product Controller II ECU as a template, mark the mounting plate for the new ECU mounting post pattern. It may be possible to use some existing holes in the plate.

NOTE: Mount the Product Controller II ECU to the side of the plate facing toward the rear of the machine with the cable connectors pointing toward the bottom of the electrical box. Position the ECU parallel with the top edge of the mounting plate. Keep in mind the electrical box cover when positioning and marking the plate for mounting the Product Controller II ECU.

2. Use a 5/16” drill bit to make any holes in the mounting plate.
3. Use the supplied 1/4” bolts, hex nuts, and flat washers to mount the Product Controller II ECU to the mounting plate facing toward the rear of the machine.

IN CAB CONNECTIONS

VIPER 4 ISOBUS CONNECTION

1. Connect the two 2-pin Deutsch ISOBUS connectors located behind the Viper® 4 together.

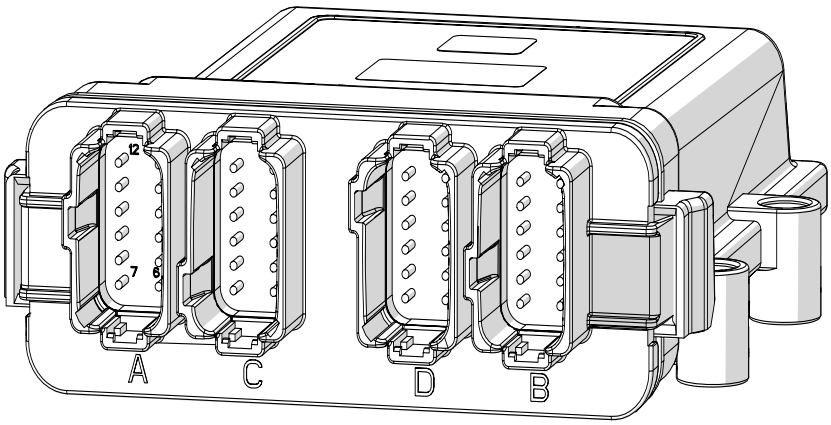
FIGURE 6. ISOBUS Connections

ECU ELECTRICAL CONNECTIONS

NODE BULKHEAD CABLE INSTALLATION (115-7303-309 CABLE)

1. Locate the large, round receptacle on the Hawkeye® retrofit cable (P/N 115-7303-309).
2. Remove the nut and washer from the receptacle.
3. Feed the receptacle through the hole previously drilled through the back of the electrical box (refer to Figure 5 on page 32).
4. Replace the washer and nut onto the connector from the back of the electrical box to secure the receptacle.
5. Route the opposite end of the cable harness to the product controller II ECU.
6. Insert the black 12-pin Deutsch plug into the Product Controller II ECU as shown inFigure 7 on page 33. Push each connector in until both retaining clips lock into place.

FIGURE 7. Product Controller II ECU Connections



Gray Green Brown Black

CHAPTER 6 CHASSIS CABLE INSTALLATION

CHASSIS CABLE ROUTING AND CONNECTION

BEST PRACTICES AND RECOMMENDATIONS

- Do not connect battery leads until all cables are installed and connected.
- Route chassis cabling along existing cabling or plumbing to help avoid pinch points or stretching the cable during normal equipment operation.

ELECTRICAL BOX CONNECTIONS

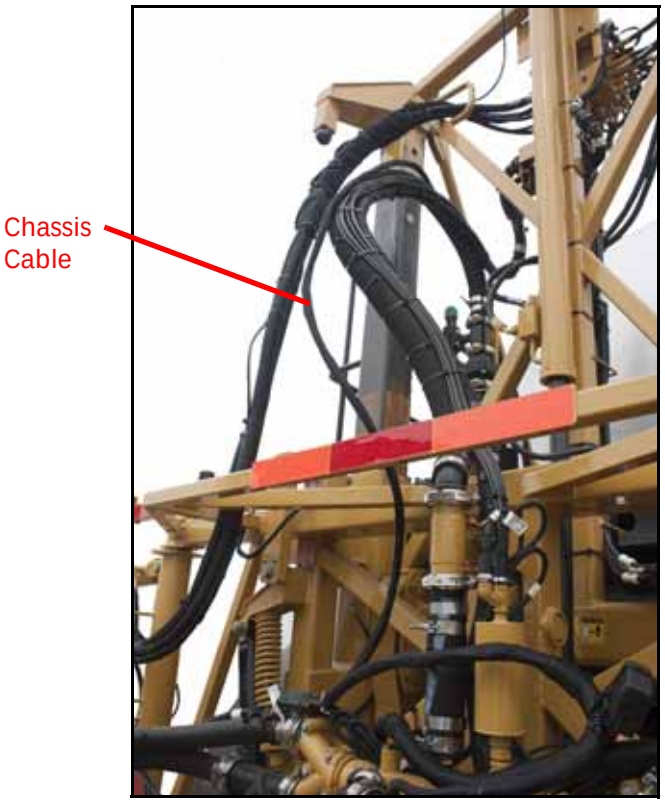
1. Locate the single, round connector on the supplied chassis cable (P/N 115-7303-310).
2. Route this connector to the electrical box and connect to the Hawkeye® bulkhead cable receptacle secured previously.
3. Connect the chassis cable to the round receptacle on the Product Controller II ECU cable already installed in the electrical box.

FIGURE 1. Chassis Cable Electrical Box Connection

CENTER RACK ROUTING AND BOOM CABLE CONNECTIONS

1. Route the round connectors labeled “left boom” and “right boom” toward the center rack of the machine.
2. Use the provided zip ties to secure the chassis cable to the undercarriage as necessary to avoid snagging the cable during machine operation.
3. At the rear of the applicator tank, route the chassis cable so it follows the chemical supply lines underneath the rear catwalk and through the center rack framework. Follow the supply lines to ensure adequate slack for operating the center rack during field operations and when folding and unfolding the booms.

FIGURE 2. Chassis Cable Center Rack Routing

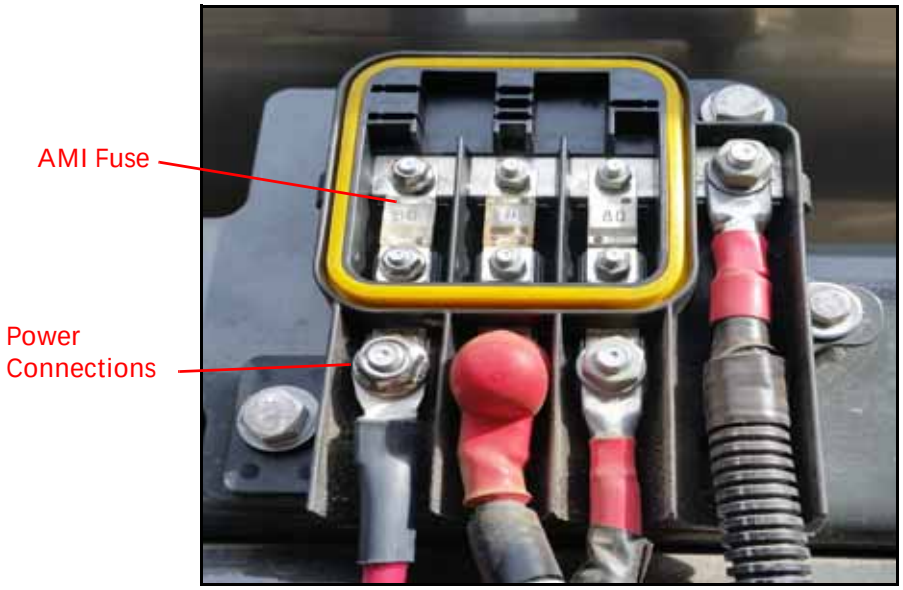


4. Use zip ties to secure the chassis cable to existing system lines to keep the cable from being damaged during normal equipment operation.
5. Connect the left and right boom cables connectors at the center rack.
6. Use supplied zip ties to secure any excess cabling on the center rack framework.
7. When installation is complete, re-connect the battery disconnect switch before operating the equipment.

HAWKEYE POWER CONNECTIONS (NO INJECTION)

1. Locate the three way fuse panel under the right-rear of the catwalk.
2. Place an 70 Amp AMI fuse (P/N 510-1003-048) in one of the two rear positions of the fuse panel.

FIGURE 3. Hawkeye Power Connection (No Injection)



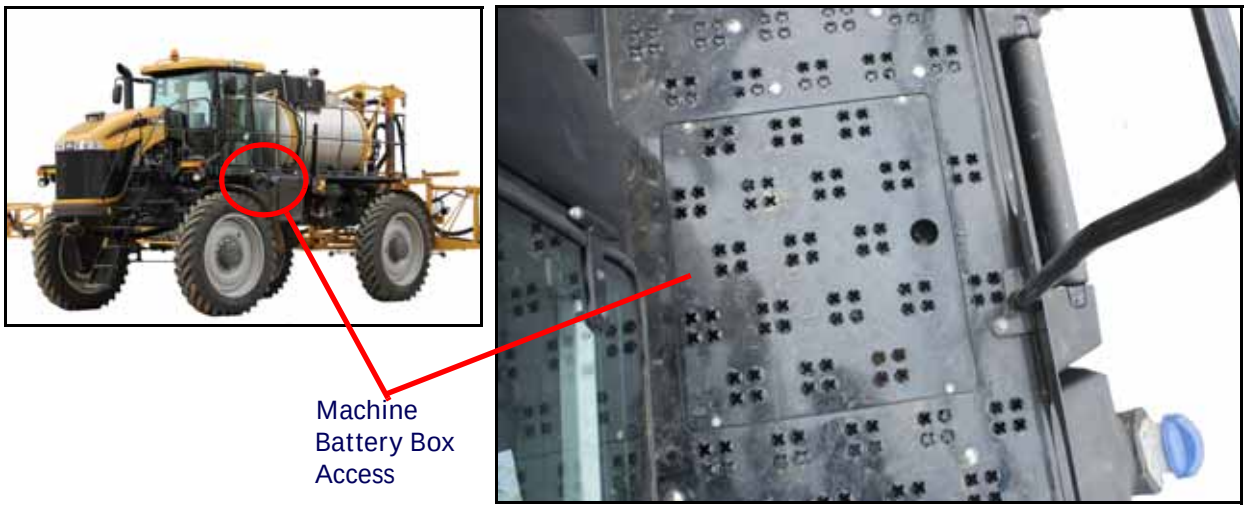
NOTE: If the system will include Sidekick Pro™ ICD injection, a secondary fuse panel is required. The injection pumps and Hawkeye® will be powered via the secondary fuse panel. Refer to See “Sidekick Pro™ ICD Installation” on page 43. for additional information.

3. Connect one the M8 x 1.25 output studs to the power supply.

BATTERY COMPARTMENT AND CONNECTIONS

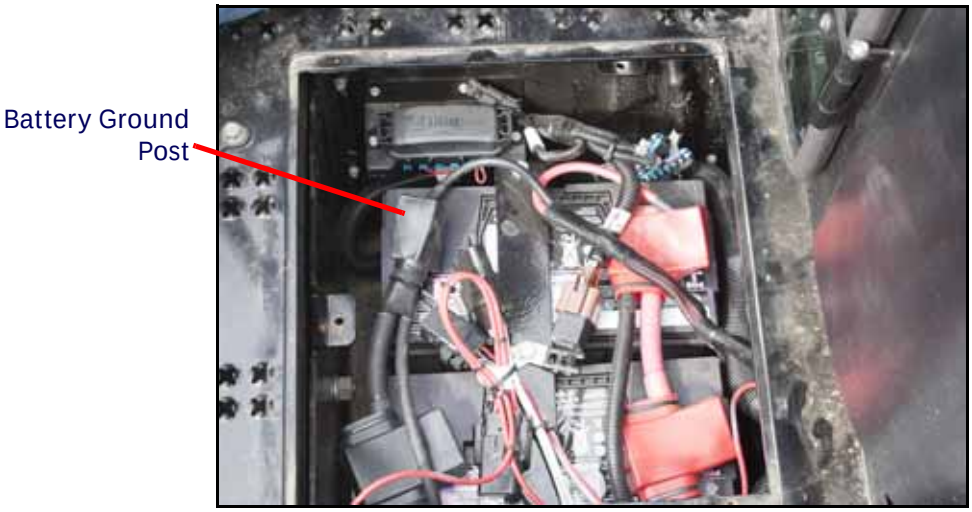
1. Disconnect the battery switch by turning the battery disconnect switch below the catwalk near the cabin door.
2. Locate the battery compartment located next to the operator cabin under the catwalk on the left side of the machine.

FIGURE 4. RoGator 1300 Battery Compartment Location



3. Remove the walkway cover and the battery compartment cover.

FIGURE 5. RoGator 1300 Battery Compartment



4. Route the Ground connection to the vehicle battery and connect to the negative battery terminal.

SYSTEM DIAGRAMS

FIGURE 6. System Diagram (Page 1)

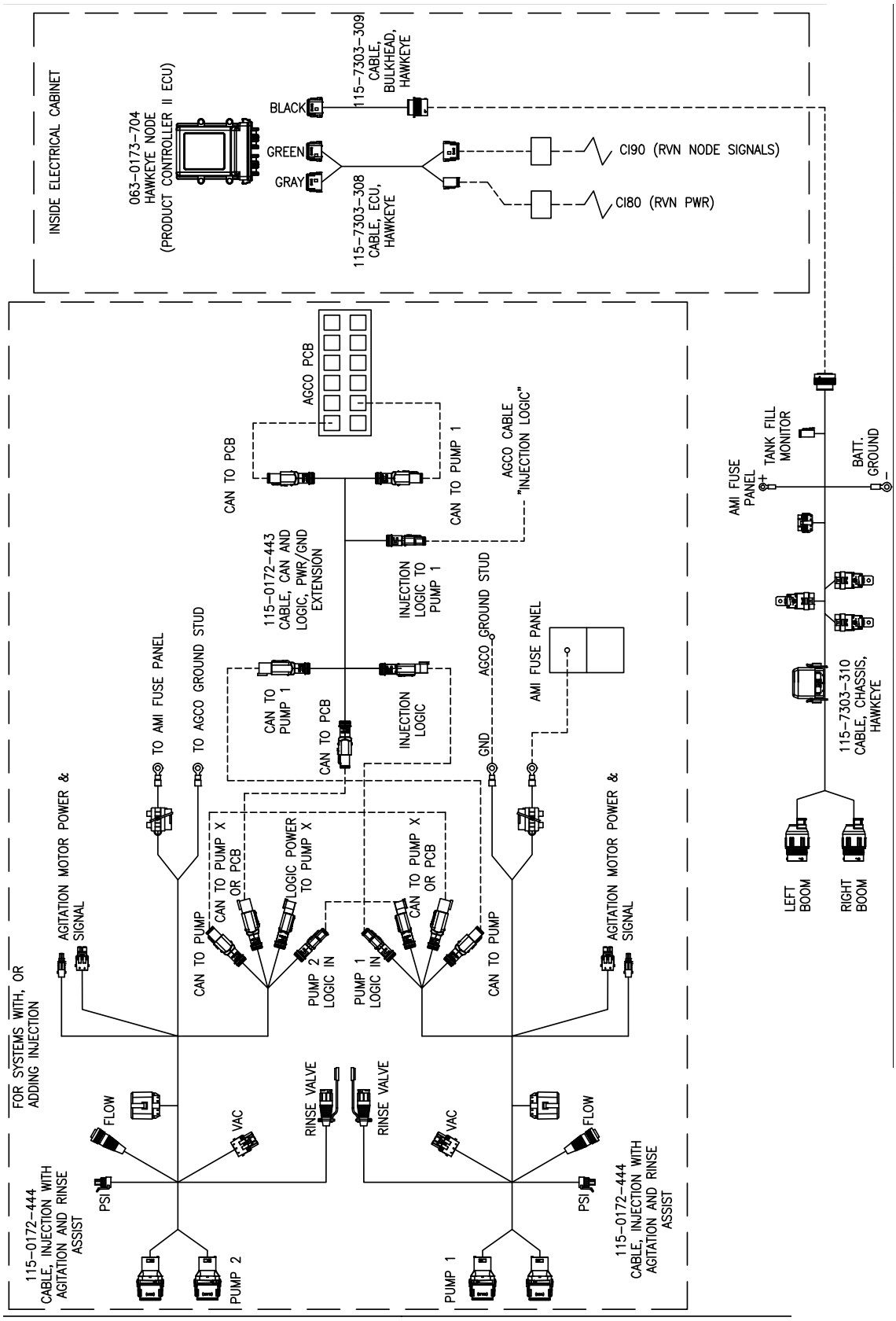
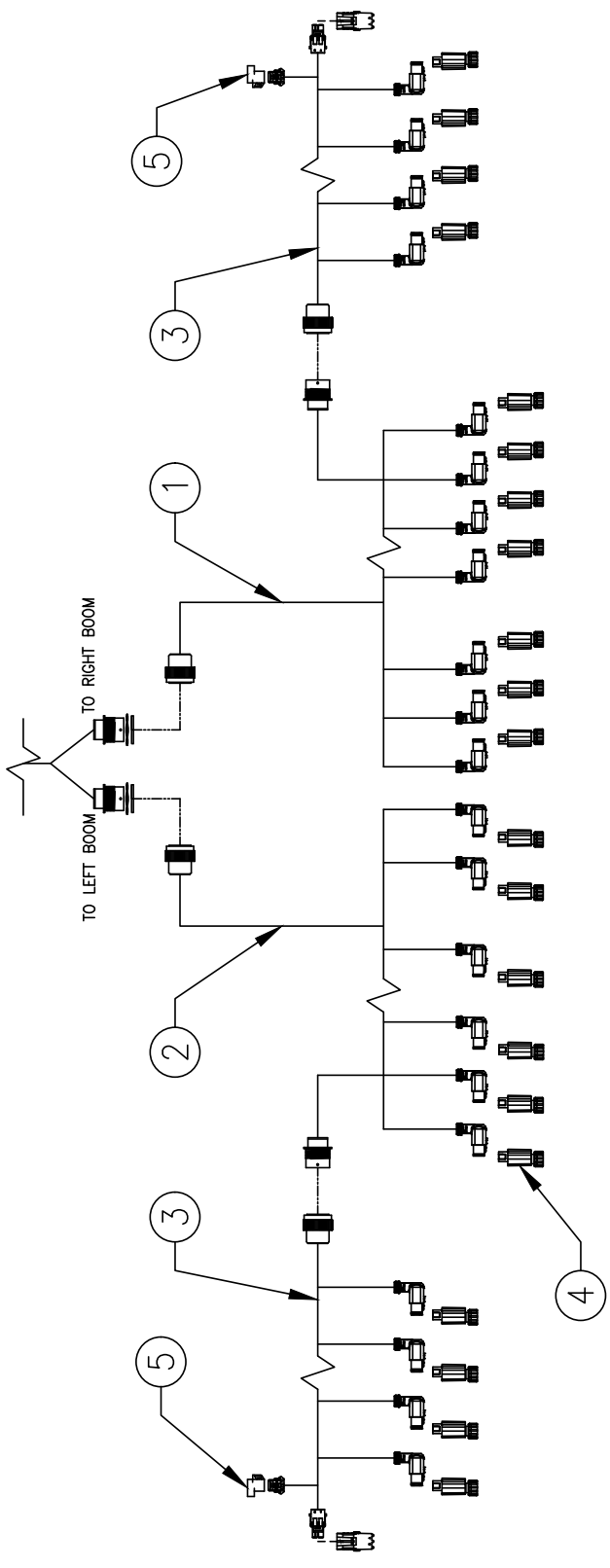
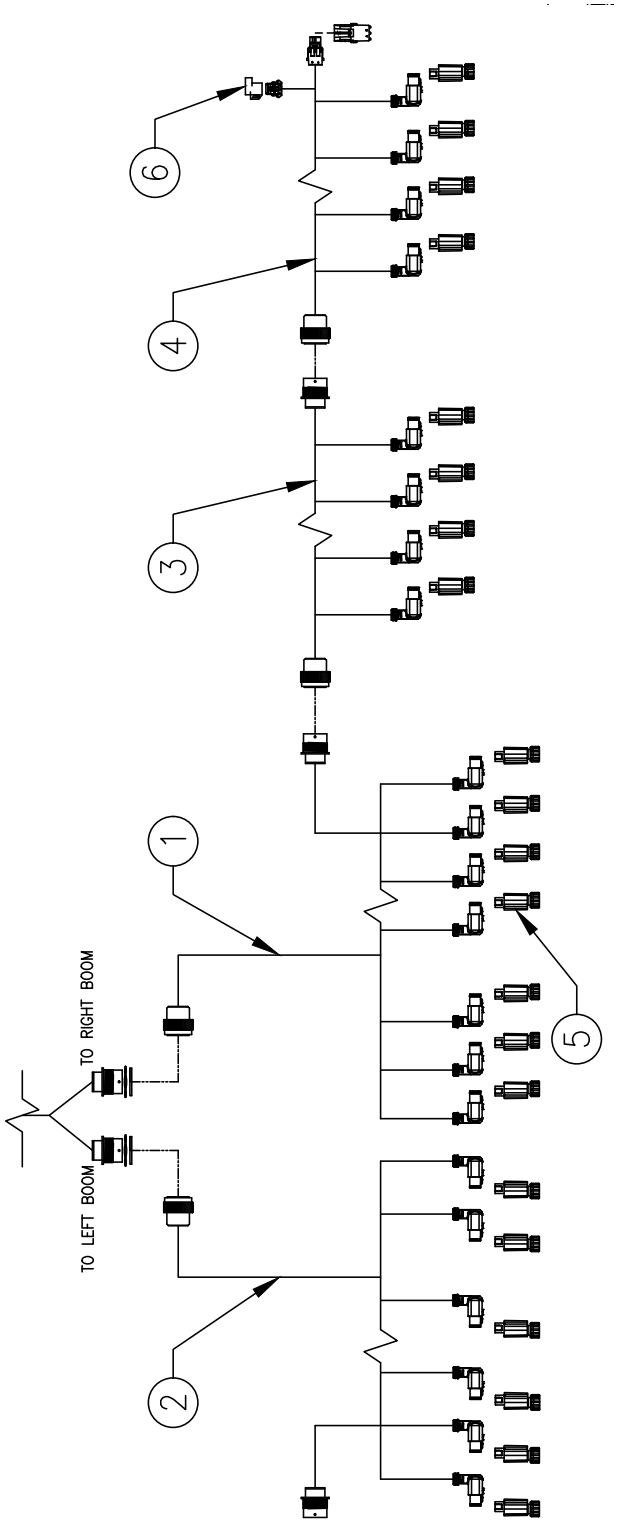


FIGURE 7. System Diagram (Page 2)



ITEM	DESCRIPTION	RG 900/1100/1300 120" BOOM 20" SPACING IN KIT P/N: 117-1007-200	RG 900/1100/1300 100" BOOM 20" SPACING IN KIT P/N: 117-1007-201	RG 900/1100/1300 90" BOOM 20" SPACING IN KIT P/N: 117-1007-202	RG 900/1100/1300 120" BOOM 15" SPACING IN KIT P/N: 117-1007-203	RG 900/1100/1300 100" BOOM 15" SPACING IN KIT P/N: 117-1007-204	RG 900/1100/1300 90" BOOM 15" SPACING IN KIT P/N: 117-1007-205
1	CABLE, RIGHT PRIMARY	115-7303-068	115-7303-109	115-7303-109	115-7303-140	115-7303-158	115-7303-158
2	CABLE, LEFT PRIMARY	115-7303-068	115-7303-109	115-7303-109	115-7303-123	115-7303-129	115-7303-129
3	CABLE, SECONDARY (QTY: 2)	115-7303-069	115-7303-110	115-7303-128	115-7303-124	115-7303-131	115-7303-130
4	TEE JET HAWKEYE VALVE ARAG/HYPRO HAWKEYE VALVE WILGER HAWKEYE VALVE	063-0173-672 063-0173-673 063-0173-674 (QTY: 72)	063-0173-672 063-0173-673 063-0173-674 (QTY: 60)	063-0173-672 063-0173-673 063-0173-674 (QTY: 54)	063-0173-672 063-0173-673 063-0173-674 (QTY: 95)	063-0173-672 063-0173-673 063-0173-674 (QTY: 79)	063-0173-672 063-0173-673 063-0173-674 (QTY: 60)
5	CAN TERMINATOR (QTY: 2)	063-0172-964	063-0172-964	063-0172-964	063-0172-964	063-0172-964	063-0172-964

FIGURE 8. Hawkeye RoGator C Series System Diagram (Page 1)



ITEM	DESCRIPTION	RG 900/1100/1300 120' BOOM 19" SPACING IN KIT P/N: 117-1007-213	RG 900/1100/1300 132' BOOM 19" SPACING IN KIT P/N: 117-1007-215	RG 900/1100/1300 100' BOOM 19" SPACING IN KIT P/N: 117-1007-216
1	CABLE, RIGHT PRIMARY	115-7306-038	115-7306-042	115-7306-052
2	CABLE, LEFT PRIMARY	115-7306-037	115-7306-041	115-7306-051
3	CABLE, MID (QTY: 2)	115-7306-039	115-7306-043	115-7306-053
4	CABLE, OUTER (QTY: 2)	115-7306-040	115-7306-044	115-7306-054
5	TEE JET HAWKEYE VALVE ARAG/HYPRO HAWKEYE VALVE WILGER HAWKEYE VALVE	063-0173-672 063-0173-673 063-0173-674 (QTY: 75)	063-0173-672 063-0173-673 063-0173-674 (QTY: 85)	063-0173-672 063-0173-673 063-0173-674 (QTY: 63)
6	CAN TERMINATOR (QTY: 2)	063-0172-964	063-0172-964	063-0172-964

APPENDIX A

SIDEKICK PRO™ ICD INSTALLATION

SIDEKICK PRO ICD CONNECTIONS TO PCB

Connecting the Sidekick Pro™ ICD pump to the Hawkeye system is done via CANBUS PCB located behind the node enclosure on the right-hand side of the machine.

For machines that do not already have injection pumps, Raven cables P/N 115-0172-443 and P/N 115-0172-444 are required. For systems that have Raven CAN Sidekick™ Pro pumps installed, simply follow the instructions below. For systems with AGCONTROL, Sidekick Pro™ ICD pumps are installed and cables are connected.

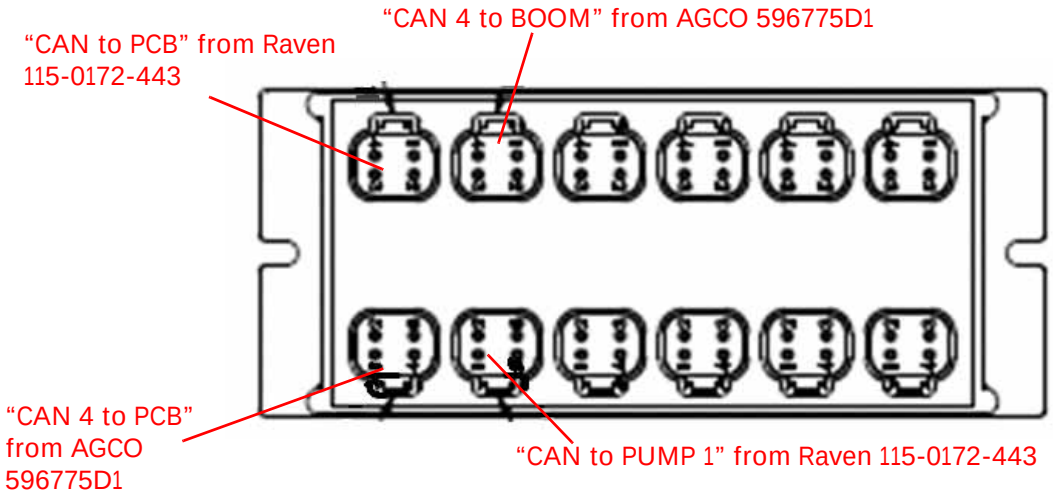
1. Locate the PCB located on the above the axle on right-hand side of the machine.

FIGURE 1. Rear PCB Location

2. Remove the cover plate.

3. On the PCB, connect the “CAN 4 to BOOM” connector on AGCO harness 596775D1 into the second receptacle in the top row. Refer to Figure 2 on page 44.

FIGURE 2. PCB Connections



4. On the PCB, connect the “CAN 4 to PCB” connector from AGCO harness 596775D1 into the first receptacle in the bottom row. Refer to Figure 2 on page 44.
5. Connect the “CAN to PUMP1” connector from the Raven harness (P/N 115-0172-443) into the second port in the bottom row.
6. Unplug the terminator from the “CAN to PCB” connector on AGCO harness 596775D1. Set terminator aside for later use.
7. Insert “CAN to PCB” from the Raven harness (P/N 115-0172-443) into the first port on the top row.
8. Locate the connector labeled “INJECTION LOGIC” from the AGCO harness 596775D1. Connect the “INJECTION LOGIG” plug from 596775D1 to the ‘INJECTION LOGIC TO PUMP 1” receptacle on the Raven Harness (P/N 115-0172-443).
9. Locate the 4-pin terminator that was removed from the “CAN to PCB” connector. Plug the “RVN CAN to PCB” from AGCO harness 596775D1 into the terminator.

NOTE: Connections shown in picture below are based on a Raven CAN Sidekick Pro™ installed on the system.

SIDEKICK PRO ICD CABLE TO PUMP CONNECTIONS

1. Route cable P/N 115-0172-443 along the frame rail and below the rear catwalk and up along the cables and hoses at the rear/center of the machine to the injection pumps.
2. Use cable P/N 115-0172-444 to connect to the first injection pump.
3. Connect the cable connections from Pump 1 to the P/N 115-0172-443 extension cable.
    - Connect the “INJECTION LOGIC” plug on the P/N 115-0172-443 extension to the 2-pin Deutsch connector on the P/N 115-0172-444 cable.
    - Connect “PUMP 1” from the P/N 115-0172-443 cable to the “CAN to PUMP” receptacle on the 115-0172-444 cable.
    - Connect “CAN to PCB” on the P/N 115-0172-443 cable to the “CAN to PUMP X or PCB” receptacle.
    - If a second pump is on the system, connect “CAN to PUMP X” to “CAN to PUMP” on the P/N 115-0172-444 cable for pump 2.
    - Remove the cap on the second 2-pin Deutsch connector and connect it to the P/N 115-0174-444 cable for pump 2.

SIDEKICK PRO ICD POWER SUPPLY

When adding Sidekick Pro™ ICD injection to the machine with Hawkeye®, a second fuse panel must be installed to accommodate the power needs.

1. Install a four way fuse pane (P/N 510-2001-068) towards the rear of the machine near the injection pumps.

FIGURE 3. Four-Way Panel

2. Connect one end of cable P/N 115-0172-446 to the open stud on the front fuse panel located rearward of the main electrical enclosure and route to the four-way fuse panel.
3. Use extra hardware from the four-way panel to install the 125 Amp fuse (P/N 510-1003-049) to the same port on the three-way fuse panel.
4. Connect the other end of cable P/N 115-0172-446 to the center stud of the four-way panel.
5. Connect the positive ring terminal of the Hawkeye® chassis cable (P/N 115-7303-310) to the port with the 70 Amp fuse on the four way panel.
6. Connect the positive ring terminal of the Sidekick Pro™ ICD cable (P/N 115-0172-444) to the port with the 30 Amp fuse on the four-way panel.
7. Repeat step 5 for additional pumps.
8. Connect the negative ring terminal from all cables to the ground stud located under the rear catwalk.
9. Secure all ring terminals with a retaining nut.

APPENDIX B CABLE AND CONNECTOR MAINTENANCE

POWER AND ECU HARNESS MAINTENANCE

1. Disconnect the ECU harness connector and inspect for signs of moisture or corrosion.
2. If moisture or corrosion is detected, use Deoxit D5, brushes, and compressed air to clean and dry the connector.
3. When clean, apply a coating of Corrosion X HD to the connector mating surfaces and contacts.
4. Reattach the connectors.

HAWKEYE® 2 BOOM HARNESS CONNECTOR MAINTENANCE

Prior to connecting the boom cable to the Hawkeye® 2 Nozzle Control Valves (NCV), perform the following steps to all 6-pin NCV connectors and 19-pin circular connectors between the boom cables and ECU cable connections to ensure high quality connections:

1. Verify the NCV connectors and the accompanying boom cable connectors are free of moisture, contamination, or oxidation. Oxidation will appear as a dry, white coating on the contacts.

   If any connectors show signs of moisture, contamination, or oxidation, perform step 2 through step 6. If this is a new installation, skip to step 7. All components listed below can be ordered in the Hawkeye® 2 NCV Connection Maintenance Kit (P/N 117-0171-692).
2. Spray the connection with a deoxidizing agent.

NOTE: DeoxIT D5 (P/N 222-4001-006) is recommended.

FIGURE 1. DeoxIT D5 Applied to Hawkeye® 2 NCV

3. Clean contacts with a small wire brush (P/N 321-0000-477).

FIGURE 2. Cleaning Contacts with a Wire Brush

4. Spray the contacts again with the deoxidizing agent to help rinse out debris.
5. Remove residue of the deoxidizing agent from the connection.

CAUTION

Damage to the connector seal may occur if residue is not removed from the connector.

6. Dry out the connection with dry, compressed air such as Dust Off Electronics Duster (P/N 222-4001-007) or equivalent air duster suitable for electronic components.

NOTE: If using compressed air from a large volume air compressor, be sure the lines are free of moisture.

FIGURE 3. Electronics Duster Used on NCV

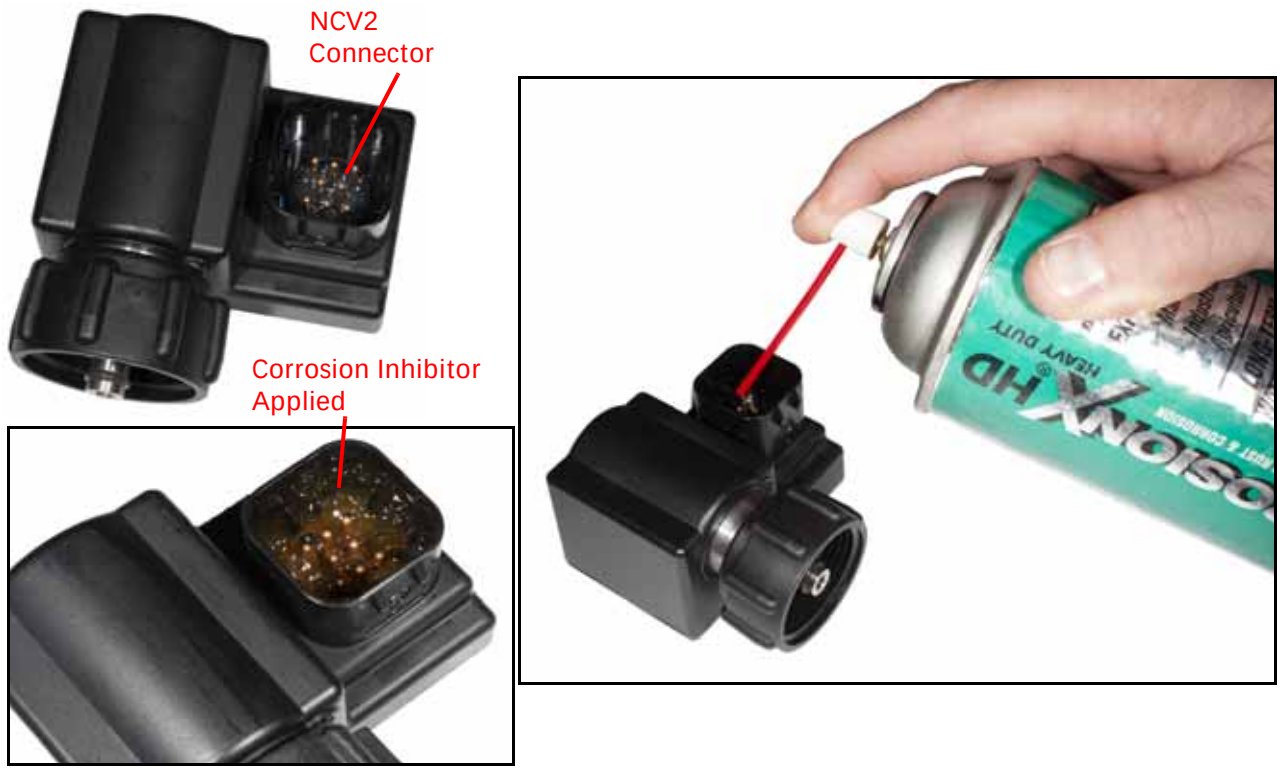
7. If not already applied, apply a single, short burst of corrosion inhibitor such as CorrosionX HD (P/N 222-0000-020) to the NCV2 connection. Be sure the corrosion inhibitor has coated the NCV2 contacts and recessed portions of the connector.

NOTE: To determine whether corrosion inhibitor has been applied, inspect for a thick liquid in the bottom of the connector as shown in the image below.

CorrosionX may also be purchased from the manufacturer website:

https://www.corrosionx.com/products/corrosionx-heavy-duty.

FIGURE 4. Applying Corrosion Inhibitor



We Solve Great Challenges.

LIMITED WARRANTY

WHAT DOES THIS WARRANTY COVER?

This warranty covers all defects in workmanship or materials in your Raven Applied Technology Division product under normal use, maintenance, and service when used for intended purpose.

HOW LONG IS THE COVERAGE PERIOD?

Raven Applied Technology products are covered by this warranty for 12 months from the date of retail sale. In no case will the Limited Warranty period exceed 24 months from the date the product was issued by Raven Industries Applied Technology Division. This warranty coverage applies only to the original owner and is non-transferable.

HOW CAN I GET SERVICE?

Bring the defective part and proof of purchase to your Raven dealer. If the dealer approves the warranty claim, the dealer will process the claim and send it to Raven Industries for final approval. The freight cost to Raven Industries will be the customer's responsibility. The Return Materials Authorization (RMA) number must appear on the box and all documentation (including proof of purchase) must be included inside the box to be sent to Raven Industries.

WHAT WILL RAVEN INDUSTRIES DO?

Upon confirmation of the warranty claim, Raven Industries will (at our discretion) repair or replace the defective product and pay for the standard return freight, regardless of the inbound shipping method. Expedited freight is available at the customer's expense.

WHAT IS NOT COVERED BY THIS WARRANTY?

Raven Industries will not assume any expense or liability for repairs made outside our facilities without written consent. Raven Industries is not responsible for damage to any associated equipment or products and will not be liable for loss of profit, labor, or other damages. The obligation of this warranty is in lieu of all other warranties, expressed or implied, and no person or organization is authorized to assume any liability for Raven Industries.

Damages caused by normal wear and tear, misuse, abuse, neglect, accident, or improper installation and maintenance are not covered by this warranty.

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EXTENDED WARRANTY

WHAT DOES THIS WARRANTY COVER?

This warranty covers all defects in workmanship or materials in your Raven Applied Technology Division product under normal use, maintenance, and service when used for intended purpose.

DO I NEED TO REGISTER MY PRODUCT TO QUALIFY FOR THE EXTENDED WARRANTY?

Yes. Products/systems must be registered within 30 days of retail sale to receive coverage under the Extended Warranty. If the component does not have a serial tag, the kit it came in must be registered instead.

WHERE CAN I REGISTER MY PRODUCT FOR THE EXTENDED WARRANTY?

To register, go online to www.ravenhelp.com and select Product Registration.

HOW LONG IS THE EXTENDED WARRANTY COVERAGE PERIOD?

Raven Applied Technology products that have been registered online are covered for an additional 12 months beyond the Limited Warranty for a total coverage period of 24 months from the date of retail sale. In no case will the Extended Warranty period exceed 36 months from the date the product was issued by Raven Industries Applied Technology division. This Extended Warranty coverage applies only to the original owner and is non-transferable.

HOW CAN I GET SERVICE?

Bring the defective part and proof of purchase to your Raven dealer. If the dealer approves the warranty claim, the dealer will process the claim and send it to Raven Industries for final approval. The freight cost to Raven Industries will be the customer's responsibility. The Return Materials Authorization (RMA) number must appear on the box and all documentation (including proof of purchase) must be included inside the box to be sent to Raven Industries. In addition, the words "Extended Warranty" must appear on the box and all documentation if the failure is between 12 and 24 months from the retail sale.

WHAT WILL RAVEN INDUSTRIES DO?

Upon confirmation of the product's registration for the Extended Warranty and the claim itself, Raven Industries will (at our discretion) repair or replace the defective product and pay for the standard return freight, regardless of the inbound shipping method. Expedited freight is available at the customer's expense.

WHAT IS NOT COVERED BY THE EXTENDED WARRANTY?

Raven Industries will not assume any expense or liability for repairs made outside our facilities without written consent. Raven Industries is not responsible for damage to any associated equipment or products and will not be liable for loss of profit, labor, or other damages. Cables, hoses, software enhancements, and remanufactured items are not covered by this Extended Warranty. The obligation of this warranty is in lieu of all other warranties, expressed or implied, and no person or organization is authorized to assume any liability for Raven Industries.

Damages caused by normal wear and tear, misuse, abuse, neglect, accident, or improper installation and maintenance are not covered by this warranty.

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